Illinois Department of PUBLIC HEALTH

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To: Emergency Departments, Infectious Disease Physicians, Infection Preventionists, Local Health Departments, Regional Offices of IDPH

From: Communicable Disease Control Section

Date: May 4, 2014

Subject: Tick season in Illinois—Information for Clinicians

Please also distribute to all primary care, internal medicine, critical care, pediatrics, family medicine, laboratory medicine staff.

The use of doxycycline to treat suspected anaplasmosis, ehrlichiosis, and Rocky Mountain spotted fever in adults and children is standard practice recommended by both CDC and the AAP Committee on Infectious Diseases. Unlike older generations of tetracyclines, the recommended dose and duration of medication needed to treat these diseases has not been shown to cause staining of permanent teeth.

1. Rocky Mountain Spotted Fever (RMSF)

A confirmed fatal case of RMSF acquired in Illinois occurred last year. Tetracycline is the drug of choice in adults and children. **Empiric treatment should be initiated as soon as RMSF is suspected to prevent serious complications or death**. RMSF is transmitted by the dog tick; dog ticks are present in all areas of Illinois.

--Signs and symptoms of RMSF include fever, malaise, headache, myalgias, loss of appetite, nausea, and vomiting, and a rash. However, all of these diagnostic clues are rarely identified on the initial patient encounter, leading to delays in appropriate therapy. Rash occurs in about 90% of RMSF cases; the typical rash first appears as spots on the wrists and ankles and then spreads to the trunk and also sometimes the palms and soles. The rash often appears two to five days after onset of fever. Some patients, especially children, may also have abdominal pain that may be severe. As with other tick-borne illnesses, some patients do not report a history of a tick bite, since the inoculation site is generally painless and often obscured by hair or a skin fold. Eighty-five percent of patients report being in a tick habitat and 63 percent reported a known tick bite.

--Most patients with Rocky Mountain spotted fever (RMSF) have a normal white blood cell count at initial presentation. As the illness progresses, thrombocytopenia becomes more prevalent and may be severe. Other supportive laboratory findings include increased hepatic transaminase levels and hyponatremia. Serologic testing is helpful for a retrospective diagnosis of RMSF but will not assist in clinical decision making. Punch biopsy of a skin lesion obtained can establish the diagnosis of RMSF; usually, delays in obtaining results make this technique minimally useful for initial patient management.

2. Lyme Disease

Reported cases of Lyme disease (transmitted by deer ticks and caused by *B. burgdorferii*) are increasing in Illinois. A significant minority of cases are associated with travel out of state (e.g.1/3 of cases have travelled to Wisconsin) . Deer ticks are most common in northern Illinois but are becoming more prevalent elsewhere in the state.

Misdiagnosis (under- and over-diagnosis) and under-/over- treatment of Lyme disease should be avoided, and physicians should be familiar with current diagnostic and treatment recommendations. Selected important points regarding diagnosis and treatment of Lyme disease are highlighted below (See also the Resource list)

--The pathognomonic erythema migrans (EM) rash is present in the majority (but not all) cases of early Lyme disease. It is not always "bulls-eye" in appearance but does expand in size over time. If a patient has an EM highly suggestive of Lyme disease and recent symptom onset (<2-3 weeks), *Borrelia burgdorferi* antibody tests are not recommended because of low sensitivity at this stage of infection.

-- Experts do not consider subjective symptoms alone, e.g., fatigue, neurocognitive symptoms, fibromyalgia-like sx as an indication for Lyme disease testing.

--IDPH recommends that laboratory tests cleared or approved by FDA be used to aid in the routine diagnosis of Lyme disease. A complete searchable list of such tests is available on the FDA website .

--Seroconversion to IgG antibodies on Western blot is expected for patients with symptoms lasting > 1 month. For patients who have had signs and symptoms for >1 month or who do not have an EM rash, diagnosis should be based on laboratory tests, in addition to symptomatology. Please see the attached CDC algorithm for diagnosis of Lyme disease.

Note: If a patient has been ill for longer than 4-6 weeks, IgM testing is not recommended. However, if IgM testing is done at this point, and the IgG Western Blot is negative, and the IgM Western Blot is positive, this is not indicative of Lyme disease.

--Long-term or repeated antibiotics for the treatment of "chronic" Lyme disease is not necessary, safe, or recommended. Evidence does not demonstrate persistence of viable *B. burgdorferi* after treatment with the correct antibiotic for the indicated treatment duration (2-4 weeks). Persistent symptoms following proper treatment may be due to lingering inflammatory processes, an unrecognized tick-borne co-infection, or an unrelated process.

3. Anaplasmosis / Ehrlichiosis

Human anaplasmosis (formerly "human granulocytic ehrlichiosis"), caused by *Anaplasma phagocytophilum,* is carried by deer ticks in the Midwest (also vectors for Lyme disease; anaplasmosis may be overlooked in patients with concurrent *B. burgdorferii* infection). Cases of anaplasmosis acquired in Illinois have been reported, primarily in the northern part of the state.

Human ehrlichiosis (caused by *Ehrlichia chaffeensis)* is transmitted by Lone star ticks, and has been reported among Illinois residents. The Lone star tick is primarily found in the southern half of Illinois, although it can occasionally be found further north. Anaplasmosis and ehrlichilosis can be fatal (~1-2% case fatality rate) Initial diagnosis of anaplasmosis and ehrlichiosis must be made based on history of potential or known tick exposure, clinical signs and symptoms, and routine blood tests. The most common laboratory abnormalities in patients with ehrlichiosis and anaplasmosis are leukopenia,

thrombocytopenia, and elevated hepatic transaminases. Presenting features of anaplasmosis and ehrlichiosis may overlap with RMSF; some patients with ehrlichiosis may develop a rash that resembles the rash of RMSF.

Diagnostic tests based on the detection of antibodies will frequently be negative in the first 7-10 days of illness. PCR tests provide the best sensitivity and specificity. A peripheral blood smear can also be performed, but sensitivity can be low. Treatment for suspected ehlichiosis and anaplasmosis should not be delayed pending the receipt of laboratory test results, or be withheld only on the basis of an initial negative laboratory result.

4. Babesiosis

Babesiosis acquired by tick bite is well described in Minnesota and Wisconsin, but has not been reported to date in Illinois. The causative agent of babesiosis, *Babesia microtiis*, is spread by deer ticks. Transfusion related babesiosis has been identified in Illinois. Diagnosis of babesiosis requires a high index of suspicion, in part because the clinical manifestations may be nonspecific. Infection can range from asymptomatic to severe. People who are asplenic, immunosuppressed, or elderly are at increased risk for life-threatening infection. In areas where babesiosis and Lyme disease are both endemic, dual infections have been reported.

Definitive diagnosis of babesiosis should be made by microscopic examination of a thin blood smear. PCR is useful in the setting of low parasitemia, (e.g., at the onset of symptoms and during convalescence) and, if necessary, to distinguish between malaria and babesiosis. Treatment regimens include atovaquone plus azithromycin or quinine plus clindamycin. Consultation with an infectious disease specialist regarding treatment is recommended if babesiosis is diagnosed.

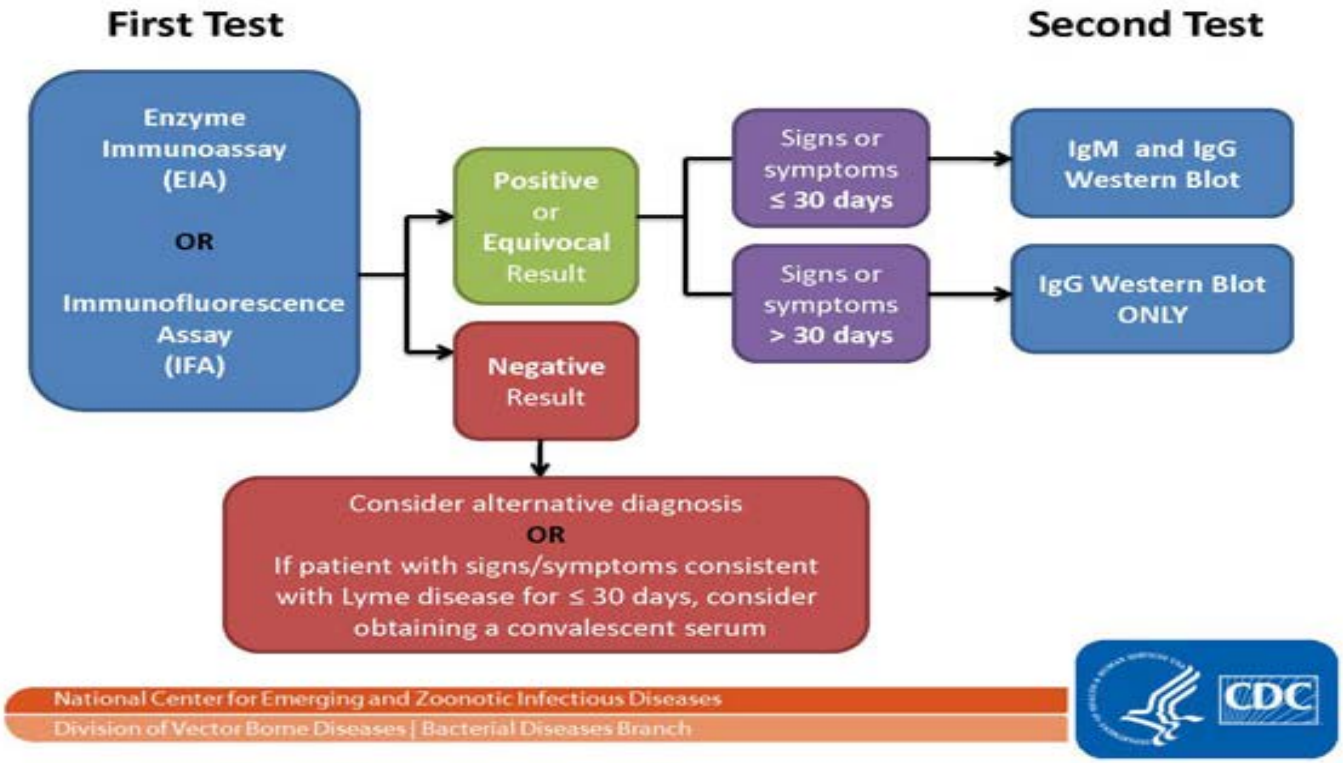
5. Prevention Measures

Preventive measures include avoiding areas where ticks are abundant, the use of tick repellants such as DEET (applied to skin) or permethrin (applied to clothing ONLY, and prompt examination and removal of ticks, if found, after exposure to tick-infested environments. Although bathing (e.g. within 2 hours of exposure) is not expected to remove attached ticks, it may wash off ticks that have not yet attached, help enhance finding ticks on skin, and reduce exposure to ticks retained in clothing.

6. Additional Resources

--CDC: Tickborne Diseases of the United States
--Tickborne Diseases of the United States, A Reference Manual for Health Care Providers
--2006 Guidelines for Lyme Disease Treatment (Developed by the Infectious Diseases Society of America
--Lyme Disease Case Study Course (CME credit available)
--Concerns Regarding a New Culture Method for *Borrelia burgdorferi* Not Approved for the Diagnosis of Lyme Disease
-- Common Ticks – Illinois Department of Public Health

Two-tiered Testing Decision Tree for Lyme Disease



The Two-tier Testing Decision Tree describes the steps required to properly test for Lyme disease. The first required test is the Enzyme Immunoassay (EIA) or Immunofluorescence Assay (IFA). If this test yields negative results, the provider should consider an alternative diagnosis; or in cases where the patient with has had symptoms for less than or equal to 30 days, the provider may treat the patient and follow up with a convalescent serum. If the first test yields positive or equivocal results, two options are available: 1) If the patient has had symptoms for less than or equal to 30 days, an IgM Western Blot is performed; 2) if the patient has had symptoms for more than 30 days, the IgG Western Blot is performed. The IgM should not be used if the patient has been ill for more than 30 days.